

# DIAGNOSTICS for the

# Kodak X-Omat 3000 RA INTEGRATED PROCESSOR

Service Code: 3466

in a

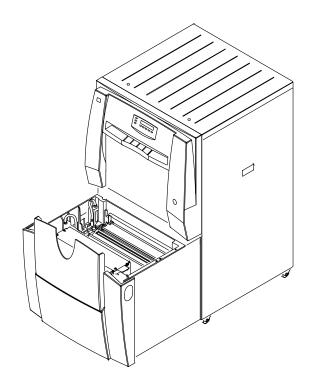
**Kodak X-Omat MULTILOADER 7000** 

Service Code: 3444

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Qualified personnel must service this equipment.



#### **PLEASE NOTE**

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This equipment includes parts and assemblies sensitive to damage from electrostatic discharge. Use caution to prevent damage during all service procedures.

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# **Section 1: Error Codes**

#### Introduction

The 5000 BOARD monitors the function of the PROCESSOR during normal operations, and continually checks for errors. When an error occurs, the DISPLAY PANEL displays the error code. Following is a brief description of the function of these error codes:

- · Error codes display by priority. The lower the error code number, the higher the priority.
- · More than one error code can occur at one time.
- When 2 or more error codes occur simultaneously, the DISPLAY PANEL displays only the error code with the highest priority.
- When the operator corrects a high priority error code, the next priority error code displays.
- The 5000 BOARD stores all error codes in an error log. Use a LAPTOP COMPUTER and the correct software to access the error log. The error log records the number of times an error occurred.
- When errors occur, the 5000 BOARD disables some components. Use the LAPTOP COMPUTER and the diagnostic tests to analyze the components.
- There are 3 types of error codes: Fatal, Nonfatal and Warning.

#### **Fatal Errors**

A fatal error indicates a problem which can harm the PROCESSOR if it continues to operate. If a sheet of film is in the PROCESSOR when a fatal error occurs, the film exits the PROCESSOR. The PROCESSOR stops operating and receives no new films. If a sheet of film enters the PROCESSOR before it stops operating, the film exits the PROCESSOR, then the PROCESSOR stops operating and receives no new films. If a Fatal Error occurs when the PROCESSOR is in the standby mode, the PROCESSOR does not operate and receives no new films. The operator cannot correct fatal errors. The operator should move BREAKER CB2, on the PROCESSOR, to the "off" or "O" position and call for service.

#### E001

Description	Possible Cause	Action
MICROCONTROLLER	5000 BOARD	Install a new 5000 BOARD.
error		

#### E002

Description	Possible Cause	Action
DRYER over maximum temperature 79°C (175°F).	DRYER THERMISTOR	Check that the resistance at 25°C (77°F) is approximately 10 K $\Omega$ .
Note Normally, the DRYER DC OVER-TEMPERATURE THERMOSTAT opens before the DRYER reaches this temperature.	SOLID STATE RELAY U3 that controls the DRYER HEATER.	Check for correct operation of SSR U3 (LED DS5). See "Troubleshooting the SOLID STATE RELAYS" on Page 17.

#### E004

Description	Possible Cause	Action
Inoperative transport	See <u>E041</u> .	

Description	Possible Cause	Action
DRYER:	AIR FLOW SWITCH	Check for correct operation.
<ul><li>Loss of air flow</li><li>OVER- TEMPERATURE</li></ul>	DRYER OVER-TEMPERATURE THERMOSTAT	Reset or install a THERMOSTAT. If the THERMOSTAT opens again, determine the cause of the over-temperature condition. See <u>E002</u> .
THERMOSTAT is open	DRYER BLOWER	Check: • FUSE F1
Note		correct operation of the BLOWER
When this error occurs, the	K5002 (DS7)	Check for correct operation.
DRYER HEATER and BLOWER are disabled		<ul> <li>If the 5000 BOARD has RELAYS that can be removed, install a new RELAY 5002.</li> </ul>
		<ul> <li>If the RELAY cannot be removed, install a new 5000 BOARD.</li> </ul>

# E007

Description	Possible Cause	Action
DEVELOPER	The DEVELOPER THERMISTOR	Install a new DEVELOPER
THERMISTOR is	is malfunctioning.	THERMISTOR.
malfunctioning.		
Note		
When this error occurs, the		
DEVELOPER HEATER is		
disabled.		

# E008

Description	Possible Cause	Action
FIXER THERMISTOR is malfunctioning.	The FIXER THERMISTOR is malfunctioning.	Install a new FIXER THERMISTOR.
When this error occurs, the FIXER HEATER is disabled.		

# E009

Description	Possible Cause	Action
DRYER THERMISTOR is malfunctioning.	The DRYER THERMISTOR is malfunctioning.	Install a new DRYER THERMISTOR.
When this error occurs, the DRYER HEATER is disabled.		

Description	Possible Cause	Action
Analog-to-digital CONVERTER is malfunctioning.	5000 BOARD	Install a new 5000 BOARD.
Note		
When this error occurs, all 3 HEATERS are disabled.		

## E013

Description	Possible Cause	Action
LEVEL SENSOR is malfunctioning.	5000 BOARD	Install a new 5000 BOARD.
Note		
This error occurs when the circuit for the LEVEL PROBE on the 5000 BOARD malfunctions. The following parts are disabled:		
DEVELOPER     REPLENISHMENT     PUMP		
FIXER     REPLENSHMENT     PUMP		
RECIRCULATION     PUMP		

#### **Nonfatal Errors**

A nonfatal error does not prevent the PROCESSOR from operating. The PROCESSOR can process film, but the image quality might decrease. The operator cannot correct most nonfatal errors. The operator should call for service.

#### E032

Description	Possible Cause	Action
DEVELOPER TANK fill	LEVEL PROBES	Clean and check the PROBES.
error.  Note	The solution level in the REPLENISHER TANK is low.	Mix new developer solution.
When this error occurs, the following parts are disabled:  • DEVELOPER REPLENISHMENT PUMP  • RECIRCULATION PUMP	Solution does not flow through the HOSES between the REPLENISHMENT TANK and the REPLENISHMENT PUMP.  The DEVELOPER DRAIN VALVE is open.	Check:      HOSE CLAMPS are tight      HOSES:      are round and open.      have no obstructions or air bubbles.  Close the VALVE.
Temperature control for the fixer and developer	The SOLID STATE RELAY U2 (LED DS3) that controls the DEVELOPER REPLENISHMENT PUMP.	Check for correct operation of SSR U2. See "Troubleshooting of SOLID STATE RELAYS" Page 17.
	POPPET VALVES in the DEVELOPER REPLENISHMENT PUMP.	Clean and check the VALVES.
	DEVELOPER REPLENISHMENT PUMP.	Check: • FUSE F1 • REPLENISHMENT PUMP MOTOR B3
	The 5000 BOARD does not energize the SOLID STATE RELAY U2.	If necessary, install a new BOARD.
	RELAY K5006 (LED DS11) on the 5000 BOARD.	<ul> <li>If the 5000 BOARD has RELAYS that can be removed, install a new RELAY.</li> <li>If the RELAY cannot be removed, install a new BOARD.</li> </ul>

This error occurs if:

- DEVELOPER TANK:
  - does not fill in 4 minutes in normal operation.
  - does not fill in 15 minutes in the Tank Fill Mode.
  - is empty and the operator does not select the Tank Fill Mode.
- · REPLENISHER TANK is empty.
- REPLENISHMENT HOSE has an obstruction.
- TANKS of the PROCESSOR are filled with water during the initial installation.

To prevent the error from occurring during the initial installation:

- add 240 mL (8 fl oz) of developer to the DEVELOPER TANK before you fill the PROCESSOR with water.
- energize the RECIRCULATION PUMP to move the developer and remove any air bubbles. Use the diagnostics to energize the PUMP.

Description	Possible Cause	Action
Fixer tank fill error.	LEVEL PROBES	Clean and check the PROBES.
Note When this error occurs,	The solution level in the REPLENISHER TANK is low.	Mix new fixer solution.
the following parts are disabled: • FIXER	Solution does not flow through the HOSES between the REPLENISHMENT TANK and the REPLENISHMENT PUMP.	<ul><li>Check:</li><li>HOSE CLAMPS are tight</li><li>HOSES:</li></ul>
REPLENISHMENT PUMP	THE ELITION WEIGHT OWN.	<ul><li>are round and open.</li><li>have no obstructions or air bubbles.</li></ul>
RECIRCULATION     PUMP	The FIXER DRAIN VALVE is open.	
Temperature control for the fixer	The SOLID STATE RELAY U4 (LED DS 2) that controls the FIXER REPLENISHMENT PUMP.	Check for correct operation of SSR U4. See "Troubleshooting of SOLID STATE RELAYS" Page 17.
and developer	POPPET VALVES in the FIXER REPLENISHMENT PUMP	Clean and check the VALVES.
	FIXER REPLENISHMENT PUMP	Check: • FUSE F1 • REPLENISHMENT PUMP MOTOR
	The 5000 BOARD does not energize the SOLID STATE RELAY U4.	If necessary, install a new 5000 BOARD.
	RELAY K5006 (LED DS11) on the 5000 BOARD.	<ul> <li>If the 5000 BOARD has RELAYS that can be removed, install a new RELAY.</li> </ul>
		If the RELAY cannot be removed, install a new BOARD.

This error occurs if:

- FIXER TANK
  - does not fill in 4 minutes in normal operation.
  - does not fill in 15 minutes in the Tank Fill Mode.
  - is empty and the operator does not select the Tank Fill Mode.
- · REPLENISHMENT TANK is empty.
- REPLENISHMENT HOSE has an obstruction.
- TANKS of the PROCESSOR are filled with water during the initial installation.

To prevent the error from occurring during the initial installation:

- add 240 mL (8 fl oz) of fixer to the FIXER TANK before you fill the PROCESSOR with water.
- energize the RECIRCULATION PUMP to move the fixer and remove any air bubbles. Use the diagnostics to energize the PUMP.

Description	Possible Cause	Action
Loss of developer heating ability.	SOLID STATE RELAY U1 (LED DS4)	Check for correct operation of SSR U1.     See "Troubleshooting of the SOLID STATE RELAYS" on Page 17.
		If necessary, install a new SSR U1.
	DEVELOPER HEATER HR1:	Check FUSE F2.
	<ul><li>open•circuit</li><li>resistance is not correct</li></ul>	<ul> <li>Check that the resistance at 25°C (77°F) is approximately 70.5 Ω.</li> </ul>
		Install a new     DEVELOPER HEATER HR1.
	The 5000 BOARD does not energize the SOLID STATE RELAY U1.	Install a new 5000 BOARD.
	Malfunction of RELAY K5004.	If the 5000 BOARD has RELAYS that can be removed, install a new RELAY.
		If the RELAY cannot be removed, install a new BOARD.
	DEVELOPER COOLING SOLENOID L2	Check that DEVELOPER COOLING SOLENOID L2 stops the developer flow through the HEAT EXCHANGER.
		If necessary, install a new DEVELOPER COOLING SOLENOID L2.
	RECIRCULATION PUMP	Check FUSE F1.
		Check voltage to RECIRCULATION PUMP MOTOR B5.
		Check for the correct operation of MOTOR B5.
		If necessary, install a new RECIRCULATION PUMP.



DEVELOPER HEATER HR1 has an internal OVERTEMPERATURE THERMOSTAT. When the HEATER is too hot, the OVERTEMPERATURE THERMOSTAT opens. Wait for the HEATER to cool and allow the THERMOSTAT to reset before you measure the resistance.

Description	Possible Cause	Action
Loss of developer cooling ability	Water does not enter the WASH TANK.	Check that water is supplied to the PROCESSOR.
		<ul> <li>The water supply is turned on.</li> </ul>
		<ul> <li>The FILTER is clean.</li> </ul>
		Check that the WASH WATER     SOLENOID L1 is operating correctly.
		Check that the SCREEN in the SOLENOID L1 has no obstructions.
		Check that the DEVELOPER     COOLING SOLENOID L2 is operating correctly.
		Check that the QUICK DISCONNECT is connected correctly.
	The temperature of the water entering the WASH TANK is too hot.	Decrease the temperature of the water supply. The wash water must be a minimum of 5.5°C (42°F) below the set•point of the developer.
	HEAT EXCHANGER in the WASH TANK	Remove any obstructions from the HEAT EXCHANGER.
	The 5000 BOARD does not energize:	Check that the correct LED on the 5000 BOARD is energized:
	WASH WATER SOLENOID L1	<ul><li>DS15 for L1</li></ul>
	DEVELOPER COOLING     SOLENOID L2	<ul> <li>DS14 for L2</li> </ul>
	SOLLINOID LZ	Check for 24 V DC at TERMINALS 1 and 2 on:
		<ul> <li>WASH WATER SOLENOID L1.</li> </ul>
		<ul> <li>DEVELOPER COOLING SOLENOID L2.</li> </ul>
		If necessary, install a new 5000 BOARD.
	There is no AC power to the RECIRCULATION PUMP.	Check for the correct operation of RELAY K5003.
		If the 5000 BOARD has RELAYS that can be removed, install a new RELAY.
		If the RELAY cannot be removed, install a new 5000 BOARD.
	RECIRCULATION PUMP	Check the RECIRCULATION PUMP MOTOR B5.
		If necessary, install a new PUMP.
	The WASH TANK CLIP is not fully	Check that the CLIP is fully seated.
	seated or is not installed.	If necessary, install a new CLIP.

Description	Possible Cause	Action
Loss of fixer heating ability.	SOLID STATE RELAY U5 (LED DS1)	Check for correct operation of SSR U5.     See "Troubleshooting the SOLID STATE RELAYS", Page 17.
		If necessary, install a new SSR U5.
	The FIXER HEATER HR2 has	Check FUSE F2.
	an open•circuit, short•circuit, or the resistance is not correct.	<ul> <li>Check that the resistance at 25°C (77°F) is approximately 70.5 Ω.</li> </ul>
		Install a new FIXER HEATER HR2.
	The 5000 BOARD does not energize the SOLID STATE RELAY U5.	Install a new 5000 BOARD.
	RELAY K5004B is malfunctioning.	Check for the correct operation of RELAY K5003.
		<ul> <li>If the 5000 BOARD has RELAYS that can be removed, install a new RELAY.</li> </ul>
		<ul> <li>If the RELAY cannot be removed, install a new 5000 BOARD.</li> </ul>
	RECIRCULATION PUMP	Check FUSE F1.
		Check for the correct operation of MOTOR B5.
		<ul> <li>If necessary, install a new RECIRCULATION PUMP.</li> </ul>

# Note

FIXER HEATER HR2 has an internal OVERTEMPERATURE THERMOSTAT. When the HEATER is too hot, the OVERTEMPERATURE THERMOSTAT opens. Wait for the HEATER to cool and allow the THERMOSTAT to reset before you measure the resistance.

Description	Possible Cause	Action
Loss of dryer heating ability.	A PANEL or DRYER RACK is not installed.	Install the PANEL or DRYER RACK.
	The SOLID STATE RELAY U3 (LED DS5) that controls the DRYER HEATER.	Check for correct operation of SSR U3. See "Troubleshooting the SOLID STATE RELAYS", Page 17.
	The RELAY K1 that enables the DRYER HEATER.	Check RELAY K1.
	No continuity for the DRYER HEATER HR3.	Check that the resistance at 25°C (77°F) is approximately 16 $\Omega$ .
	DRYER OVER-TEMPERATURE THERMOSTAT	Allow the THERMOSTAT to reset. If the THERMOSTAT opens again, determine the cause of the high temperature. If you cannot determine the cause of the problem, install a new THERMOSTAT.
	No continuity for the DRYER HEATER THERMAL CUTOFF.	Check that the DRYER BLOWER operates correctly.
		Install a new CUTOFF.
	The 5000 BOARD does not energize the SOLID STATE RELAY U3.	If necessary, install a new 5000 BOARD.
	RELAY K5001 (LED DS6) is malfunctioning.	If the 5000 BOARD has RELAYS that can be removed, install a new RELAY.
	This RELAY controls the COIL of RELAY K1.	If the RELAY cannot be removed, install a new BOARD.

Description	Possible Cause	Action
Loss of transport speed control  Note	5000 BOARD	If the control voltage is not correct at TEST POINT MOTDRV on the 5000 BOARD,
This error occurs when the		install a new BOARD.
transport speed is set for 10 seconds and the speed is not within 7.6 cm/min (3 in./min) of the set•point.	7000 BOARD	Engage the PROCESSOR in the MULTILOADER 7000 and check for the following voltages on the 7000 BOARD:  • 24 V DC between PINS 1 and 10 of PJ7003
		5 V DC between PINS 4 and 10 of PJ7003
	DC DRIVE MOTOR B6 or DRIVE MOTOR	If MOTOR B6 operates, but no pulses occur at TEST POINT MOTFB on the 5000
	CONTROLLER	BOARD while the MOTOR is energized,
		check: • MOTOR B6
		• CONTROLLER

When the PROCESSOR operates normally:

- The supply voltage from the QUAD POWER SUPPLY through the 7000 BOARD to the DRIVE MOTOR CONTROLLER is 24 V DC at PIN 3 on the DRIVE MOTOR CONTROLLER.
- The control voltage at TEST POINT MOTDRV on the 5000 BOARD is approximately:
  - 1.9 V DC for the Standard Speed
  - 2.6 V DC for the Rapid Speed
  - 3.4 V DC for the K/RA Speed



Sometimes there are large variations in control voltages between PROCESSORS.

Feedback pulses from the DRIVE MOTOR CONTROLLER at TEST POINT MOTFB on the 5000 BOARD indicate the speed of the DRIVE MOTOR.

If the transport operates slower than the set speed, the MICROPROCESSOR increases the control voltage approximately 25 mV every second at TEST POINT MOTDRV on the 5000 BOARD. When the voltage reaches 5 V DC, the MICROPROCESSOR stops increasing the voltage.

#### E042

Description	Possible Cause	Action
Loss of accessory data link	Loose connections	Check all connections between any
		MULTILOADER 7000 and the
		PROCESSOR.

Description	Possible Cause	Action
STATIC RAM BATTERY failure	BATTERY powered RAM is corrupted. The cycle default values are loaded into the cycle process parameters. Any changes are not saved during power up.	Install a new CLOCK/MEMORY MODULE U21.  Note  You need to enter any custom process parameters or set•points.

# **Warning Errors**

A warning error indicates a temporary condition or a problem which can be corrected by the operator. The PROCESSOR operates and can process films. Image quality might decrease.

#### E128

Error Description	Possible Cause	Action
The PROCESSOR is	The PROCESSOR is	Engage the PROCESSOR in the
not engaged in the	extended.	MULTILOADER 7000.
MULTILOADER 7000.	INTERLOCK SWITCH S4	Check SWITCH S4.
Note		If necessary, install a new SWITCH S4.
When this error	7000 BOARD	Install a new 7000 BOARD.
occurs, the following parts are disabled:		
• FILM		
TRANSPORT		
DRYER HEATER		
DRYER BLOWER		

## E129

Error Description	Possible Cause	Action
TANKS currently being filled	None	None. This message clears automatically when tanks are filled.
Note When this error occurs, the following parts are disabled:		
film transport     RECIRCULATION     PUMP		
• 3 HEATERS • DRYER BLOWER		

#### E130

Error Description	Possible Cause	Action
REPLENISHMENT	None	Use the KEYPAD to select either "Automatic" or
PUMPS are disabled		"Flooded" replenishment to enable the PUMPS.

## E132

Error Description	Possible Cause	Action
The developer is	None	None. This message clears automatically when the
under the set		developer reaches the set-point temperature.
temperature.		

Error Description	Possible Cause	use Action	
The developer is over	None	None. This message clears automatically when the	
the set temperature.		developer reaches the set•point temperature.	

# E134

Error Description	or Description Possible Cause Action	
The DRYER is under	None	None. This message clears automatically when the
the set temperature.		DRYER reaches the set point temperature.

# E141

Error Description	Possible Cause	Action
Low	None	None. This message clears automatically when the
DEVELOPER TANK		developer solution reaches the correct level.
level.	No developer in	Mix new developer solution.
<b>◯</b> Note	DEVELOPER	
When this error	REPLENISHMENT TANK	
occurs, the following		
parts are disabled:		
RECIRCULATION		
PUMP		
temperature		
control for the fixer		
and developer		

# E142

Error Description	Possible Cause	Action
Low FIXER TANK	None	None. This message clears automatically when the
level.		fixer solution reaches the correct level.
When this error occurs, the following parts are disabled:	No fixer in FIXER REPLENISHMENT TANK	Mix new fixer solution.
RECIRCULATION     PUMP		
temperature control for the fixer and developer		

# Section 2: Troubleshooting the SOLID STATE RELAYS

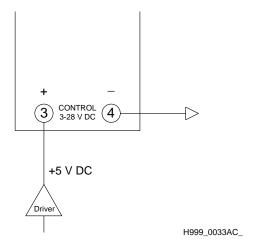
## **Theory**

SOLID STATE RELAYS (SSRs) are primarily used to control HEATER loads that energize and de-energize several times per minute. The two main advantages of using SSRs are:

- increased reliability compared to conventional electromechanical RELAYS.
- · reduced current requirement for the control voltage.

# **Normal Voltages**

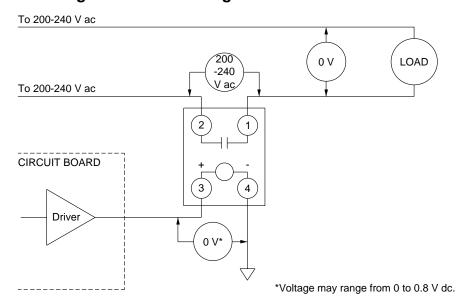
#### **Voltage Requirements**



The SSR negative TERMINAL 4 is permanently connected to ground. The SSR energizes when +5 V DC is applied to the positive TERMINAL. This +5 V DC comes from an INTEGRATED CIRCUIT DRIVER on the 5000 BOARD. If a DC meter is placed across the control TERMINALS, the SSR is considered energized if +5 V DC is measured across the control TERMINALS.

The control voltage can range from 3 to 5 V DC. This measurement must be made <u>across the TERMINALS</u>.

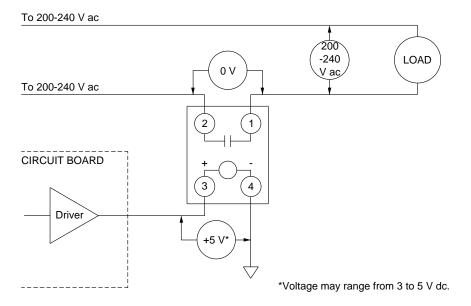
#### Normal Voltages for the De-energized Mode



H999\_0030BC\_

When the SSR has 0 V DC applied across TERMINALS 3 and 4, 0 V AC is applied to the LOAD device.

## **Normal Voltages for the Energized Mode**



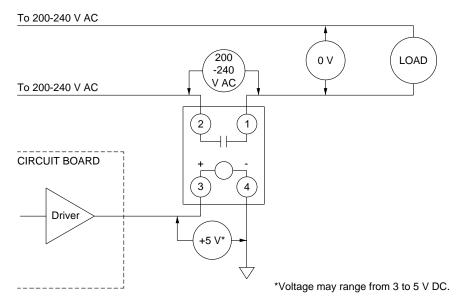
H999\_0031BC\_

When the SSR has +3 to +5 V DC applied across TERMINALS 3 and 4, 200 - 240 V AC is applied to the LOAD device.

#### **Malfunctions of SSRs**

RELAY voltage controls such as SSRs are complex. There are 4 primary conditions which might indicate malfunctions with the SSR.

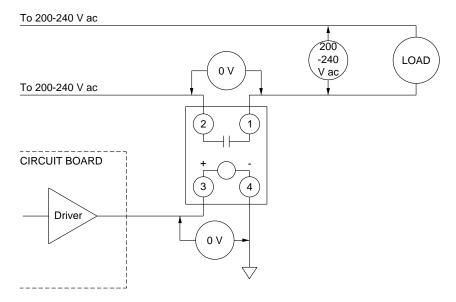
#### **Open•Circuit Voltages**



H999\_0036BC\_

The SSR has an open•circuit. The load is never energized. The control voltage, +3 to + 5 V DC across TERMINALS 3 and 4, is applied, but the SSR does not energize the load device.

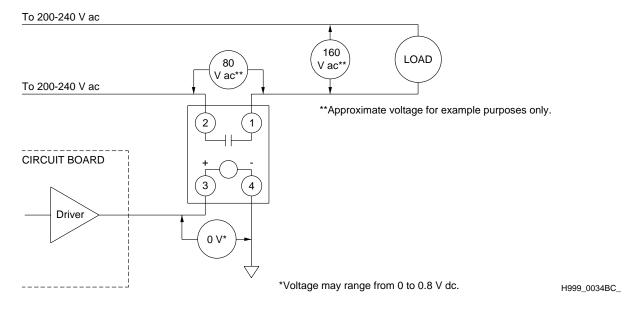
#### Short Circuit Voltages



H999\_0037BC\_

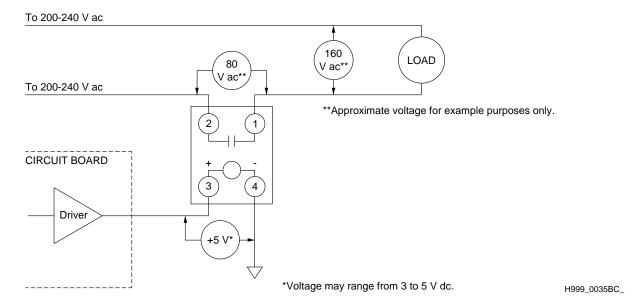
The SSR has a short-circuit. The load is always energized. The control voltage is not applied, 0 V across TERMINALS 3 and 4, but the load is energized.

#### Half-Wave Short-Circuit Voltages with the Control Voltage De-energized



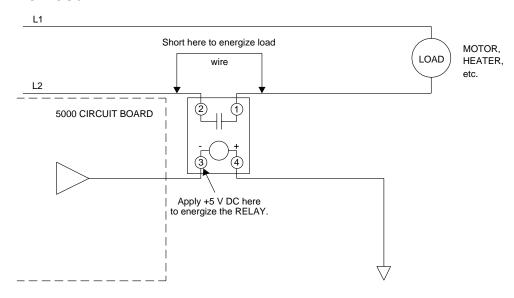
In a half-wave short-circuit, the load is always partially energized with no control voltage applied, 0 V DC across TERMINALS 3 and 4. This is because half of the SSR has a short-circuit and passes half-wave rectified voltage to the load. A voltmeter indicates a voltage between 0 V AC and 240 V AC across the load. When the control voltage is applied to the SSR, the normal 200 to 240 V AC is applied to the load device.

#### Half-Wave Open•Circuit Voltages with the Control Voltage Energized



In a half-wave open•circuit, half of the SSR is never energized, and half is energized when the control voltage is applied. The SSR is energized by the signal from the BOARD, 5 V DC across TERMINALS 3 and 4, but the load only has low voltage power. An open•circuit of half of the SSR causes this malfunction. The SSR can only supply half-wave rectified alternating current to the load. The VOLTMETER indicates voltage between 0 - 240 V AC across the load when the SSR is energized. In this condition, half of the SSR is always de-energized.

#### Wire Test



H999\_0023BC\_

Before installing new parts, do these tests to locate the problem:

- Control voltage is supplied. The SSR energizes, but the load does not energize.
  - Result: A failure of the load device.
- Control voltage is supplied to the SSR, but the SSR does not energize.
  - Result: A failure of the SSR.
- The 5000 BOARD does not send the control voltage at the correct time.
  - Result: A failure of the 5000 BOARD.

# **Section 3: Mechanical Diagnostics**

# **Transport Malfunctions**

Possible Cause	Solution		
RACKS and CROSSOVERS	Check:     RACKS and CROSSOVERS are in the correct positions and are seated correctly		
	RACKS and CROSSOVERS are square - See "RACK: Squareness."     ADJUSTMENTS AND REPLACEMENTS, Publication No. 3H9568		
	RACKS and CROSSOVERS are clean - <u>See "RACK ASSEMBLIES."</u> PREVENTIVE MAINTENANCE, Publication No. 3H9569		
	CROSSOVER TROUGHS are in the correct positions		
	WASH RESERVOIR is installed correctly		
ROLLERS	Check: ROLLERS are in the correct positions and rotate freely GUDGEONS for damage		
	GEARS, SPROCKETS, and IDLERS engage correctly and are not broken or worn		
	BEARINGS for wear		
	SPRINGS and E-RINGS are installed correctly		
	tension of the DRIVE CHAIN		
DRYER RACK	Check:  • BAFFLES are installed in the AIR TUBES		
	DRYER AIR TUBES are in the correct position		
	temperature setting of the DRYER is set correctly		
	DRYER RACK is seated correctly		
	LOCK TABS are in the correct positions		
	DRIVE GEAR on the DRYER RACK for damage		

# **Artifacts and Wrong Film Densities**

Possible Cause	Solution	
Replenishment system	<ul> <li>Check: <ul> <li>replenishment is set to the correct rate</li> <li>replenishment calibration is correct</li> <li>HOSES are opened and contain no obstructions or air bubbles</li> <li>HOSE CLAMPS are tight</li> <li>REPLENISHMENT PUMP is operating correctly</li> <li>DRAIN VALVES on the DEVELOPER and FIXER TANKS are completely closed</li> <li>LEVEL SENSOR PROBES and CONNECTORS are clean</li> <li>chemicals are mixed correctly and there is sufficient supply in the REPLENISHMENT TANKS</li> </ul> </li> </ul>	
	<ul> <li>Note</li> <li>Change any chemicals that are not mixed correctly, are exhausted, or are contaminated. When you mix chemicals:</li> <li>Mix a maximum of a 2-week supply of the DEVELOPER REPLENISHER.</li> </ul>	
	<ul> <li>Follow all directions for mixing chemicals and solutions.</li> <li>Use a SPLASH GUARD and DRIP TRAY when you remove the FIXER RACK from the PROCESSOR to prevent contamination of the developer.</li> </ul>	
Recirculation system	Check:	
RACK and CROSSOVER AYS	<ul> <li>Check:</li> <li>RACKS and CROSSOVER AYs are in the correct positions, are seated correctly and are cleaned completely - See "RACK ASSEMBLIES." PREVENTIVE MAINTENANCE, Publication No. 3H9569</li> <li>CROSSOVER TROUGHS and EVAPORATION COVERS are in the correct positions</li> <li>TROUGHS are clean</li> <li>TROUGH DRAINS contain no obstructions</li> <li>WASH RESERVOIR is installed correctly, is clean, and contains no obstructions.</li> </ul>	

Possible Cause	Solution		
ROLLERS	Check:		
	ROLLERS are clean and not scratched		
	ROLLERS are in the correct positions and rotate freely		
	GUDGEONS for damage and wear		
	DETECTOR ROLLERS are clean		
	GEARS, SPROCKETS, and IDLERS for wear		
	GEARS, SPROCKETS, and IDLERS engage correctly		
	BEARINGS for wear		
	SPRINGS and E-RINGS for damage		
	DRIVE CHAINS for correct tension		
Drying system	Check:		
	DRYER AIR TUBES are in the correct position and clean - if necessary use a BOTTLE BRUSH and water to clean the TUBES and SLOTS in the TUBES		
	BAFFLES are installed		
	temperature of the DRYER is set to lowest temperature that dries film		
	exhaust connected to the PROCESSOR is to specification		
Wrong water temperature	Check that the temperature is at least 6.7°C (44°F) below the developer set•point.		
Wash water	Check:		
	water flows through the WASH RACK		
	holes in the WASH RESERVOIR are clean		
Ventilation system	Check:		
	exhaust connected to the PROCESSOR is to specification		
	<ul> <li>external and internal EXHAUST HOSES are connected to the AIR EXHAUST</li> </ul>		

# **Wet Films**

Possible Cause	Solution		
Film and chemicals are not compatible	Check that the film is compatible with the selected system.		
Replenishment system	Check: • replenishment rates have the correct setting		
	HOSES are not kinked, round and have no obstructions		
	HOSE CLAMPS are tight		
	REPLENISHMENT PUMP is operating correctly		
	calibration of the REPLENISHMENT PUMP		
	chemicals are correctly mixed		
	chemicals are not contaminated		
	level of solutions in the REPLENISHMENT TANKS		
	DRAIN VALVES for the DEVELOPER and FIXER TANKS are completely closed		
	Note		
	Change any chemicals that are not mixed correctly, are exhausted, or are contaminated. When you mix chemicals:		
	<ul> <li>mix a maximum of a 2-week supply of the DEVELOPER REPLENISHER</li> </ul>		
	follow all directions for mixing chemicals and solutions		
	<ul> <li>use a SPLASH GUARD and DRIP TRAY when you remove the FIXER RACK from the PROCESSOR to prevent contamination of the developer</li> </ul>		
Recirculation system	Check the movement of the solutions at the surface of the full TANKS when you energize. If the solutions do not move, check:  • HOSES have no obstructions or air bubbles in the recirculation sys		
	RECIRCULATION PUMP operates		
	DEVELOPER FILTER is clean and in the correct position		
Drying system	Check:		
	BAFFLES are installed		
	temperature of the DRYER is set low		
	AIR EXHAUST has no obstructions and is installed correctly		
	DRYER HEATER operates correctly		
	DRYER RACK is seated correctly		
Wash water	Check:		
	water flows through the WASH RACK     hales in the WASH RESERVOIR are one; if necessary along the		
	<ul> <li>holes in the WASH RESERVOIR are open - if necessary, clean the holes to prevent an overflow of water from the TROUGHS into the DEVELOPER and FIXER TANKS</li> </ul>		

# **Solution Levels**

Possible Cause	Solution		
Replenishment system	Check:		
	<ul> <li>replenishment rates are set correctly</li> </ul>		
	<ul> <li>HOSES are not kinked, round, and have no obstructions</li> </ul>		
	operation and calibration of the REPLENISHMENT PUMP		
	<ul> <li>quantity of solution in the REPLENISHMENT TANKS</li> </ul>		
	POPPET VALVES are clean and have no damage		
	DRAIN VALVES on the DEVELOPER and FIXER TANKS have no leakage		
	CROSSOVER TROUGHS are in the correct position and clean		
	TROUGH DRAINS have no obstructions		

# **Publication History**

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